

### Abstract

An apparatus for dissociating gases includes a plasma chamber that may be formed from a metallic material and a transformer having a magnetic core surrounding a portion of the plasma chamber and having a primary winding. The apparatus also includes one or more switching semiconductor devices that are directly coupled to a voltage supply and that have an output coupled to the primary winding of the transformer. The one or more switching semiconductor devices drive current in the primary winding that induces a potential inside the chamber that forms a plasma which completes a secondary circuit of the transformer.

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